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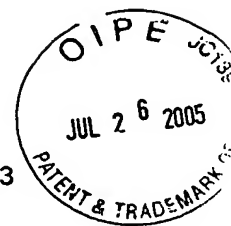
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21-07-'05 12:06 從 WINSTON HSU, NO. 41526 8064986673 T-537 P01/16 U-502



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Art Unit: 2814

Fax: (571) 273-8300

From : Winston Hsu, Registration No. 41,526

Serial No.: 10/791,709

Attorney Docket No.: UECF0012USA

Subject: Information Disclosure Statement (IDS)

Total Pages: 16 pages (including cover page)

Winston Hsu 2005/07/20

UECF0012USA0_D1_1

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21-07-'05 12:21 從 WINSTON HSU, NO. 41526 8064986673		T-538 P09/16 U-502
<p>⑤ BUNDESREPUBLIK DEUTSCHLAND</p> <p></p> <p>DEUTSCHES PATENT- UND MARKENAMT</p>	<p>⑥ Patentschrift</p> <p>⑦ DE 199 45 134 C 2</p> <p>⑧ Aktenzeichen: 198 45 134,6-83</p> <p>⑨ Anmeldetag: 21. 9. 1999</p> <p>⑩ Offenlegungstag: 31. 5. 2001</p> <p>⑪ Veröffentlichungstag der Patenterteilung: 14. 8. 2003</p>	<p>⑫ Int. Cl. 7:</p> <p>H 01 L 27/15</p> <p>H 01 S 5/323</p> <p>H 01 L 23/62</p> <p>H 01 L 33/00</p>
<p>Innertell von 3 Monaten nach Veröffentlichung der Erteilung kann Einspruch erhoben werden</p>		
<p>⑬ Patentinhaber:</p> <p>OSRAM Opto Semiconductors GmbH, 83049 Regensburg, DE</p> <p>⑭ Vertreter:</p> <p>Eppinger, Hermann & Fischer GbR, 80339 München</p>	<p>⑮ Erfinder:</p> <p>Wojcikowski, Torsten, Dr., 93049 Regensburg, DE; Huber, Wolfgang, Dr., 93059 Regensburg, DE</p> <p>⑯ Für die Beurteilung der Patentfähigkeit in Betracht gezogene Druckchriften:</p> <p>DE 24 30 873 A1</p> <p>EP 09 33 942 A2</p>	
<p>⑰ Lichtemittierendes Halbleiterbauelement hoher ESD-Festigkeit und Verfahren zu seiner Herstellung</p> <p>⑱ Lichtemittierendes Halbleiterbauelement, mit einem Halbleitersubstrat (8) und einer auf dem Halbleitersubstrat aufgetragenen Halbleiterschicht (10), wobei eine erste Kontaktmetallisierung (7) auf der Substratoberfläche aufgebracht ist und eine zweite Kontaktmetallisierung (7) auf der Substratoberfläche gegenüberliegenden Oberfläche der Halbleiterschicht aufgebracht ist und mit einem leitenden Übergang (10) an der einen Seite des Lichtemittierenden Abschnitts (10) und einem einen Schutzkontakt (20) an der anderen Seite des Lichtemittierenden Abschnitts (10) aufweisenden Schutzkontaktabschnitt (20), wobei der Schutzkontaktabschnitt (20) eine höhere Fußspannung als die in derselben Orientierung parallel geschaltete Lichtemittierende Abschnitte (10) aufweist, und bei einer zwischen den Kontaktmetallisierungen (7, 7) an das Bauelement angelegten Spannung, die höher als die Fußspannung des Schutzkontaktabschnitts (20) ist, einen geringeren elektrischen Widerstand als der Lichtemittierende Abschnitt (10) aufweist, dadurch gekennzeichnet, daß der Lichtemittierende Abschnitt (10) und der Schutzkontaktabschnitt (20) nebeneinander ausgebildet sind, ein sich von der zweiten Kontaktmetallisierung (7) bis in eine bestimmte Tiefe des Bauelements erstreckender, den leitenden Übergang (10) und den Schutzkontaktabschnitt (20) elektrisch voneinander isolierender Abschnitt (18) ausgebildet ist, und der Lichtemittierende pn-Übergang (2a) ein Teil eines sich über den Lichtemittierenden Abschnitt (10) und den Schutzkontaktabschnitt (20) erstreckenden pn-Übergangs (2) ist, der leitende Abschnitt (15) sich bis vor den pn-Übergang (2) erstreckt, und der Schutzkontaktabschnitt (2b, 71) aus dem anderen Teil des pn-Übergangs (2) und einer weiteren Diode gebildet ist.</p>		
<p>DE 199 45 134 C 2</p> <p style="text-align: right;">BUNDESDRUCKEREI 06.03 203 330/07/05 1</p>		

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21-07-'05 12:32 從 WINSTON HSU, NO. 41526 8064986673 T-539 P10/16 U-502

DE 199 45 134 C 2

1

Beschreibung

[0001] Die Erfindung betrifft ein lichtemittierendes Halbleiterbauelement nach dem Oberbegriff des Patentanspruchs 1 und ein Verfahren zur Herstellung nach Patentanspruch 9.

[0002] Ein derartiges Bauelement ist aus der DE 26 30 873 A1 bekannt. Bei dem bekannten lichtemittierenden Halbleiterbauelement handelt es sich um eine Leuchtdiode, die von einem pn-Übergang in einem Substrat gebildet ist. Neben der Leuchtdiode ist eine optische Schicht auf das Substrat aufgebracht. In der optischen Schicht ist eine weitere parallel zur Leuchtdiode geschaltete Schutzdiode ausgebildet, die bei Spannungen oberhalb des Arbeitsspannens der Leuchtdiode eine größere Leitfähigkeit als die Leuchtdiode aufweist und dadurch die Leuchtdiode vor Überspannungen in Flußrichtung schützt.

[0003] Ein Nachteil des bekannten lichtemittierenden Halbleiterbauelements ist, daß sein Aufbau eines mehrstufigen Herstellungsprozesses mit einer guten Homogenität des Schutzdiodenabschnitts und des lichtemittierenden Abschnitts erfordert.

[0004] Weiterhin sind Halbleiter-Laserdioden, insbesondere sogenannte Vertikalresonator-Laserdioden (VCSELs) bekannt, die ein zunehmendes Interesse in der optischen Datenübertragung und in der SecureIT finden. Den vielen positiven Eigenschaften von VCSELs steht jedoch der Nachteil gegenüber, daß diese Bauelemente eine relativ geringe Leistung gegen RSD-Überspannungen (Statische Discharge) aufweisen. Gründe für Anwendungen im kommerziellen und industriellen Bereich werden von den Kunden jedoch RSD-sichere Bauelemente gefordert, d. h. in der Regel müssen die Bauelemente eine RSD-Spannung von 2000 V überstehen können. Dabei wird das sogenannte ESD-Body-Modell zugrundegelegt, bei dem eine bestimmte Kapazität mit der entsprechenden Spannung aufgeladen wird und die Entladung der Kapazität über das zu testende Bauelement erfolgt.

[0005] Die Bauelementeigenschaften dürfen sich trotz der kurzzeitigen hohen Spannungsbelastung nicht verschlechtern. VCSELs besitzen je nach Bauform jedoch nur RSD-Festigkeiten im Bereich einiger 100 V. Belastungen in Spannungsrichtung der Diode ergeben dabei wesentlich kleinere RSD-Festigkeiten als in Flußrichtung. Daher sind für die RSD-Festigkeit von VCSELs die Belastungen in Spannungsrichtung entscheidend.

[0006] Um Bauelemente mit geringen RSD-Festigkeiten zu vermeiden, müssen spezielle RSD-Sicherheitsvorkehrungen getroffen werden, was in den meisten Anwendungsfällen von der Anwendersite her nicht akzeptabel ist. Messungen an VCSEL-Bauelementen mit unterschiedlichen Durchmessern haben ergeben, daß die RSD-Festigkeit von VCSELs absteigend von der Größe der aktiven Fläche bei, wobei es sich, daß eine größere aktive Fläche auch eine größere RSD-Festigkeit bewirkt. Da aber die aktive Fläche von VCSELs nicht entscheidend andere Bauelementeigenschaften wie Schwellstrom, Widerstand, Strahlqualität, usw. bestimmt, kann nicht einfach eine größere Bauelementgröße gewählt werden, um die RSD-Festigkeit zu verbessern. Diese Schwierigkeit ist nicht nur mit VCSEL-Dioden, sondern auch bei anderen lichtemittierenden Halbleiterbauelementen, wie beispielsweise kostenintensiven Laserdioden und LEDs, auf.

[0007] Aus der EP 0 933 842 A2 ist daher eine Anordnung mit einem VCSEL bekannt, in dem eine Schutzdiode parallel geschaltet ist. Sowohl der VCSEL, auch die Schutzdiode sind auf einem Substrat in einer Halbleiterschichtfolge ausgebildet, wobei die Schutzdiode durch bis

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zum Substrat reichende Öffnen vom VCSEL elektrisch isoliert ist. Schutzdiodenabschnitt und lichtemittierender Abschnitt sind bei der bekannten Anordnung daher räumlich getrennt.

[0008] Ausgehend von diesem Stand der Technik liegt der Erfindung die Aufgabe zugrunde, ein einfach herstellbares lichtemittierendes Halbleiterbauelement hoher RSD-Festigkeit und ein Verfahren zur Herstellung anzugeben, wobei die übrigen Bauelementeigenschaften nicht wesentlich beeinträchtigt werden sollen.

[0009] Diese Aufgabe wird mit den kennzeichnenden Merkmalen des Patentanspruchs 1 gelöst.

[0010] Demgemäß beschreibt die Erfindung ein lichtemittierendes Halbleiterbauelement mit einem Halbleitersubstrat und einer auf dem Halbleitersubstrat aufgetragenen Halbleiterschichtfolge, wobei die Halbleiterschichtfolge einen einen lichtemittierenden pn-Übergang enthaltenden lichtemittierenden Abschnitt und einen Schutzdioden umfassenden Schutzdiodenabschnitt aufweist, die nebeneinander ausgebildet sind, eine erste Kontaktmetallisierung auf der Schutzschichtfläche und eine zweite Kontaktmetallisierung auf der Substratoberfläche gegenüberliegendes Oberfläch der Halbleiterschichtfolge aufgebracht ist, und der Schutzdiodenabschnitt derart ausgebildet ist, daß der Schutzdiodenabschnitt eine höhere Flußspannung und bei einer erwichen den Kontaktmetallisierungen an das Bauelement angelegten Spannung, die höher als die Flußspannung des Schutzdiodenabschnitts ist, einen geringeren elektrischen Widerstand als der lichtemittierende Abschnitt aufweist. Der lichtemittierende Abschnitt und der Schutzdiodenabschnitt in der Halbleiterschichtfolge sind räumlich nebeneinander angeordnet, wobei ein sich von der zweiten Kontaktmetallisierung bis vor den pn-Übergang des Bauelements erstreckender, den lichtemittierenden Abschnitt und den Schutzdiodenabschnitt elektrisch voneinander isolierender Abschnitt ausgebildet ist, der lichtemittierende pn-Übergang ein Teil eines sich über den lichtemittierenden Abschnitt und den Schutzdiodenabschnitt erstreckenden pn-Übergangs ist, und der Schutzdiodenabschnitt am dem anderen Teil der pn-Übergangs und einer weiteren Diode gebildet ist.

[0011] Die Schutzdiodenabschnittsabschnitte sind somit dem pn-Übergang des lichtemittierenden Abschnitts parallel geschaltet und weisen eine höhere Durchbruch- oder Kollapsspannung als der pn-Übergang auf. Im normalen Arbeitsbetrieb des Halbleiterbauelements fließt praktisch der gesamte Strom über den lichtemittierenden Abschnitt, da die an den lichtemittierenden Abschnitt und die Schutzdioden parallel angelegte Spannung unterhalb der Durchbruchspannung der Schutzdioden liegt. Während also bei normalem Betrieb praktisch kein Strom über die parallel geschalteten Schutzdioden fließt, bewirkt eine hohe Spannung während einer RSD-Belastung eine Durchschaltung der Schutzdioden. Aufgrund des dann sehr niedrigen elektrischen Widerstands des Schutzdiodenabschnitts gegenüber dem lichtemittierenden Abschnitt fließt der überwiegende Teil des RSD-Belastungsstromes über die parallelen Schutzdioden. Dadurch wird ein signifikante lichtemittierende Halbleiterbauelement geschützt.

[0012] Insbesondere ist vorgesehen, daß die Kontaktlinie einen Überkreuzungspunkt oberhalb der Kollaps- oder Durchbruchspannung der Schutzdioden aufweisen.

[0013] Weiterhin ist vorgesehen, daß der pn-Übergang sich über die gesamte Breite des Halbleiterbauelements erstreckt und eine der Schutzdioden durch den in dem Schutzdiodenabschnitt befindlichen Abschnitt des pn-Übergangs gebildet ist. Die weitere Diode ist dabei vorzugsweise durch einen Schottky-Kontakt zwischen dem zweiten elektrischen

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22-07-'05 12:05 從- WINSTON HSU, NO. 41526 8064986673 T-599 P01/16 U-546



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From : Winston Hsu, Registration No. 41,526

Serial No.: 10/791,709

Attorney Docket No.: UECP0012USA

Subject: Information Disclosure Statement (IDS)

Total Pages: 16 pages (including cover page)

Winston Hsu 07/21/2005

RESUBMIT

Information Disclosure Statement (IDS)

Dear Sir,

The applicant submitted this Information Disclosure Statement on 07/21/2005 in US eastern time 00:05 AM via fax number 571-273-8300.

However, the submission was either failed or incomplete, the applicant hereby submits the Information Disclosure Statement again via fax number 703-872-9306. Please ignore the previous submission, and take the current submission as substitute.

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22-07-'05 12:15 從 WINSTON HSU, NO. 41526 8064986673 T-600 P03/16 U-546

TRANSMITTAL FORM	
Application Number	10/791,709
Filing Date	03/04/2004
First Named Inventor	Jen-Chau Wu
Att. Unit	2814
Examiner Name	PHAM, LONG
Attorney Docket Number	UECP0012USA
(To be used for all correspondence after this filing)	
Total Number of Pages in This Submission	14

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	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	150	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

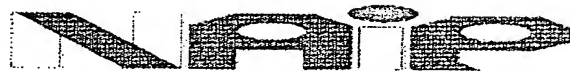
PAGE 10 * REV'D AT 7/22/05 12:16:12 AM [Eastern Daylight Time] * SVR32PTO-SPRINT-04 * P05/8/22/04 * CDD 8064986673 * PULSATION (mm=41)01-20

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名稱 : WINSTON HSU, NO. 41526

檔案號碼 : 546
日期 : 22.07 12:05
至 : 800217038729306
原稿頁數 : 16
啓始時間 : 22.07 12:05
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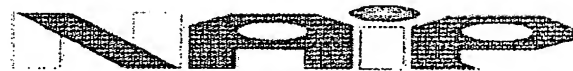
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記憶傳送報表

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名稱 : WINSTON HSU, NO. 41526

檔案號碼 : 502
日期 : 21.07 12:05
至 : 800215712738300
原稿頁數 : 16
啓始時間 : 21.07 12:06
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From : Winston Hsu, Registration No. 41,526

Serial No.: 10/791,709

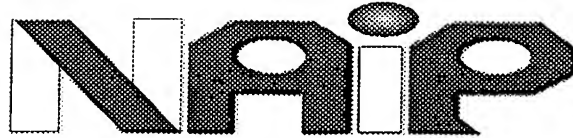
Attorney Docket No.: UECP0012USA

Subject: Information Disclosure Statement (IDS)

Total Pages: 16 pages (including cover page)

Winston Hsu 2005/07/20

UECP0012USA0_D1_1



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From : Winston Hsu, Registration No. 41,526

Serial No.: 10/791,709

Attorney Docket No.: UECF0012USA

Subject: Information Disclosure Statement (IDS)

Total Pages: 16 pages (including cover page)

Winston Hsu 07/21/2005

RESUBMIT

Information Disclosure Statement (IDS)

Dear Sir,

The applicant submitted this Information Disclosure Statement on 07/21/2005 in US eastern time 00:05 AM via fax number 571-273-8300.

However, the submission was either failed or incomplete, the applicant hereby submits the Information Disclosure Statement again via fax number 703-872-9306. Please ignore the previous submission, and take the current submission as substitute.

UECF0012USA0_D1_1



PTO/SB/97 (09-04)

Approved for use through 07/31/2006. OMB 0651-0031

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Certificate of Transmission under 37 CFR 1.8

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on 07/21/2005
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Note: Each paper must have its own certificate of transmission, or this certificate must identify each submitted paper.

Application No: 10/791,709

(1) Transmittal Form	1 PAGE
(2) Fee Transmittal	1 PAGE
(3) Information Disclosure Statement	12 PAGES

This collection of information is required by 37 CFR 1.8. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1.8 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

14

Application Number

10/791,709

Filing Date

03/04/2004

First Named Inventor

Jen-Chau Wu

Art Unit

2814

Examiner Name

PHAM, LONG

Attorney Docket Number

UECP0012USA

ENCLOSURES (Check all that apply)



Fee Transmittal Form



Fee Attached



Amendment/Reply



After Final



Affidavits/declaration(s)



Extension of Time Request



Express Abandonment Request



Information Disclosure Statement



Certified Copy of Priority Document(s)



Reply to Missing Parts/
Incomplete Application



Reply to Missing Parts
under 37 CFR 1.52 or 1.53



Drawing(s)



Licensing-related Papers



Petition



Petition to Convert to a
Provisional Application



Power of Attorney, Revocation



Change of Correspondence Address



Terminal Disclaimer



Request for Refund



CD, Number of CD(s) _____



Landscape Table on CD



After Allowance Communication to TC



Appeal Communication to Board
of Appeals and Interferences



Appeal Communication to TC
(Appeal Notice, Brief, Reply Brief)



Proprietary Information



Status Letter



Other Enclosure(s) (please identify
below):

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name

North America Intellectual Property Corporation

Signature

Winston Hsu

Printed name

Winston Hsu

Date

07/21/2005

Reg. No.

41,526

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

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Date

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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PTO/SB/17 (12-04)

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Effective on 12/08/2004.

Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2005☐ Applicant claims small entity status. See 37 CFR 1.27**TOTAL AMOUNT OF PAYMENT** (\$) 180.00**Complete if Known**

Application Number	10/791,709
Filing Date	03/04/2004
First Named Inventor	Jen-Chau Wu
Examiner Name	PHAM, LONG
Art Unit	2814
Attorney Docket No.	UECP0012USA

METHOD OF PAYMENT (check all that apply)

- ☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____
- ☒ Deposit Account Deposit Account Number: 50-3105 Deposit Account Name: North America Intellectual Property Corp.
- For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)
- ☒ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, except for the filing fee
- ☒ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☒ Credit any overpayments

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**FEE CALCULATION****1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 or, for Reissues, each claim over 20 and more than in the original patent	50	25
Each independent claim over 3 or, for Reissues, each independent claim more than in the original patent	200	100
Multiple dependent claims	360	180

Total Claims **Extra Claims** **Fee (\$)** **Fee Paid (\$)** **Multiple Dependent Claims**
_____ - 20 or HP = _____ x _____ = _____ **Fee (\$)** **Fee Paid (\$)**

HP = highest number of total claims paid for, if greater than 20

Indep. Claims **Extra Claims** **Fee (\$)** **Fee Paid (\$)**
_____ - 3 or HP = _____ x _____ = _____

HP = highest number of independent claims paid for, if greater than 3

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
_____ - 100 = _____	_____ / 50 = _____	(round up to a whole number) x _____	= _____	

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

Other: submission of Information Disclosure Statement

Fees Paid (\$)

18 0.00

SUBMITTED BY

Signature	<u>Winston Hsu</u>	Registration No. (Attorney/Agent)	41,526	Telephone	302-729-1562
Name (Print/Type)	Winston Hsu	Date	07/21/2005		

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wu, Jen-chau et al.

5 Appl. No.: 10/791,709 Filing Date: 03/04/2004

Examiner: PHAM, LONG Art Unit: 2814

Docket No.: UECP0012USA

10 Title: ESD PROTECTION CONFIGURATION AND METHOD
FOR LIGHT EMITTING DIODES

To: Commissioner for Patents
P.O. BOX 1450
Alexandria, VA 22313-1450

15 Subject: Information disclosure statement under 37 CFR §1.56

Dear Sir,

20 This is an Information Disclosure Statement in accordance with the
duty to disclose information material to patentability under 37 CFR
§1.56. The applicant wishes to make of record the document(s) listed on
the accompanying form PTO/SB/08.

25 Since this IDS is filed after the mailing date of the first Office
action but before notice of allowance, consideration of the information
disclosure statement is hereby requested according to 37 CFR §1.97(c).
That each item of information contained in the information disclosure
30 statement was first cited in an Office communication mailed on
01/14/2005 for the counterpart German patent application number 10
2004 014 864.3, which are more than three months from the filing of the

information disclosure statement. Accordingly, the fee of submission of an information disclosure statement set forth in § 1.17(p) is enclosed to fulfill § 1.97 requirement.

5 According to the requirement set forth in 37 C.F.R. §1.98 and M.P.E.P. 609, the applicants are submitting a copy of the cited reference (German Patent DE 19945134C2) and an English language abstract of the cited German patent. The English language title and abstract of DE 19945134C2 are listed as follows:

10

Title:

LIGHT EMITTING SEMI-CONDUCTING COMPONENT WITH HIGH
ESD RIGIDITY AND METHOD FOR PRODUCTION OF SAID
COMPONENT

15

Abstract:

The invention relates to a light-emitting semi-conducting component of a light-emitting segment (10), especially a VCSEL-semi-conducting laser diode and a protective diode segment (20)
20 connected in parallel. Said protective diode (3b, 71) is a series circuit of a Schottky-contact (71) and a part of a (3b) pn-junction (3). At larger ESD-voltage loads, the protective diode (3b, 71) is triggered, so that a majority of said electrical current flows through said protective diode (3b, 71) and said laser diode is thereby protected.

25

It is respectfully requested that the examiner can consider the document(s) listed on the accompanying form PTO/SB/08 and that it be made of record in the application. The applicants sincerely hope that the examiner initials the cited reference(s) on the form and that a copy
30 of the initialed form be sent to the applicants with the next communication from the examiner.

Respectfully submitted,

Winston Hsu

Date: July 21, 2005

Winston Hsu, Patent Agent No. 41,526

5 P.O. BOX 506, Merrifield, VA 22116, U.S.A.

Voice Mail: 302-729-1562

Facsimile: 806-498-6673

e-mail : winstonhsu@naipo.com

10 Note: Please leave a message in my voice mail if you need to talk to me. The time in D.C. is 12 hours behind the Taiwan time, i.e. 9 AM in D.C. = 9 PM in Taiwan.

